

LESSON SUMMARY

CXC CSEC MATHEMATICS

UNIT Seven:
Geometry

Lesson

12

Lines and Angles

Textbook: Mathematics, A Complete Course by Raymond Toolsie, Volume 1

(Some helpful exercises and page numbers are given throughout the lesson, e.g. Ex 9b page 428)

INTRODUCTION

Straight lines and angles have many real life applications. In this lesson the foundation will be established for more in-depth work with lines and angles.

OBJECTIVES

At the end of this lesson you will be able to:

- a) State what is a line
- b) Identify different types of angles
- c) Uses properties of angles and lines to determine magnitudes of different angles



7.1 Lines and Angles

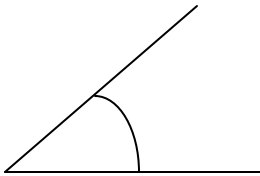
Lines

Lines are geometrical figures that extend indefinitely in opposite directions.

Angles

Angles are formed where two lines meet at a point called a vertex.

Example:



Types of Angles

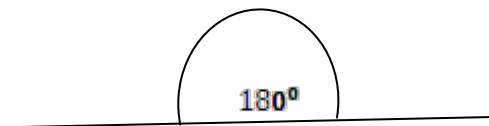
Right Angle

This is an angle of 90° .



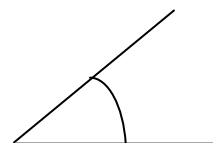
Straight Angle

This is the angle on a straight line. It measures 180° .



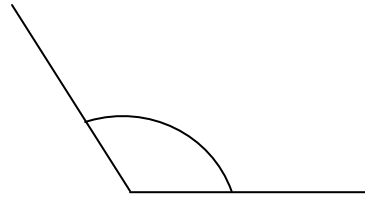
Acute Angle

This is an angle that measures between 0° and 90° .



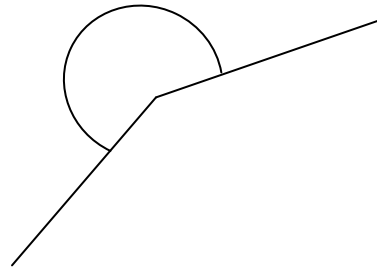
Obtuse Angle

This is an angle between 90° and 180° .



Reflex Angles

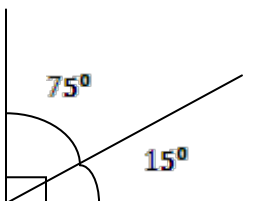
This is an angle between 180° and 360° .



Complementary Angles

These are two angles that add up to 90° .

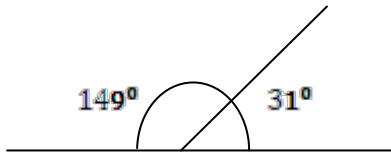
Example:



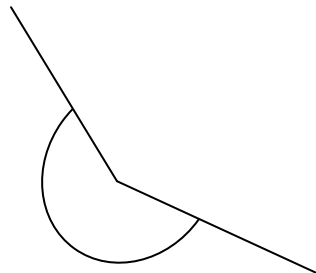
Supplementary Angles

These are two angles that add up to 180° .

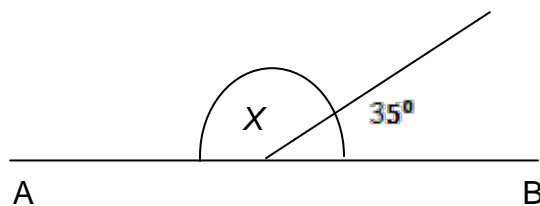
Example:



1. What type of angle is shown by the following:



2. Calculate the magnitude of the following angle x if A and B are two points on a straight line.

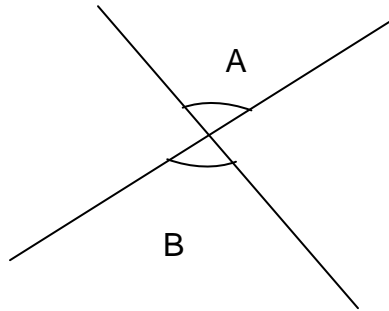


Properties of angles

Adjacent Angles

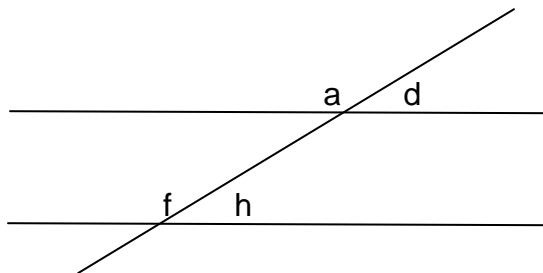
Two angles that share a vertex are said to be adjacent. As seen before two adjacent angles on a straight line add up to 180° .

When two straight lines intersect vertically opposite angles are equal.



Angles A and B are equal.

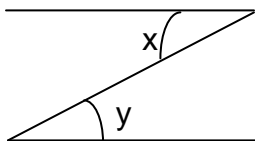
When a transversal or a straight line cuts two other parallel lines the corresponding angles or angles formed in similar positions are equal.



note $a = f$ and $d = h$.

Alternate Angles are equal.

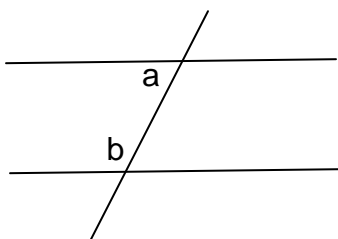
Example:



Angles x and y are equal.

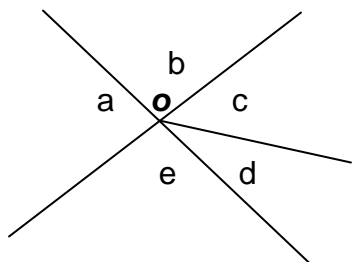
Interior angles on the same side of the transversal are supplementary. (add up to 180°)

Example:



$$a + b = 180^\circ$$

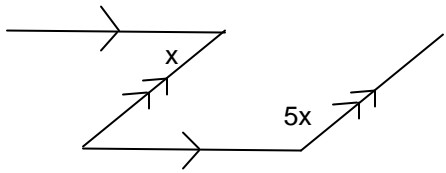
Angles at a point add up to 360° .



$$a + b + c + d + e = 360^\circ$$

The theories stated above can be used to solve many problems which involve line and angles.

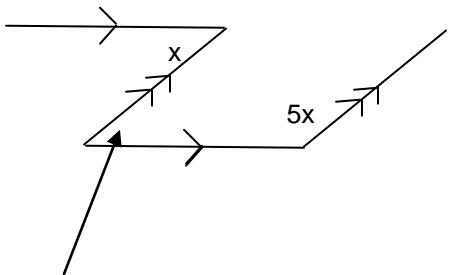
Example:



The arrows show the lines that are parallel.

Form an equation and solve for x . (Ex 9b page 429)

Solution:



This angle is equal to x since alternate angles are equal. Therefore the equation is

$x + 5x = 180^\circ$ since interior angles are supplementary.

To solve:

$$6x = 180^\circ$$

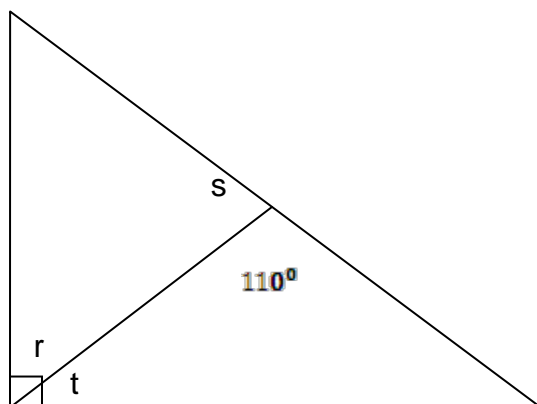
$$x = \frac{180^\circ}{6}$$

$$x = 30^\circ$$

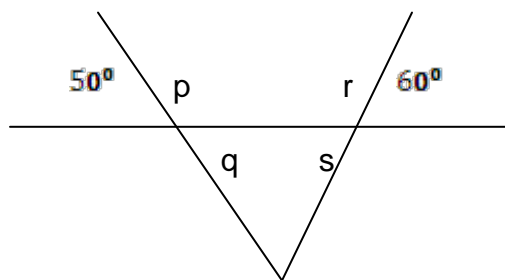


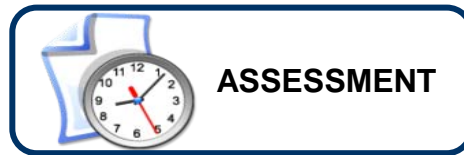
ACTIVITY 2

1. (a) Angle s is twice angle t . Determine the size of angles r , s and t .

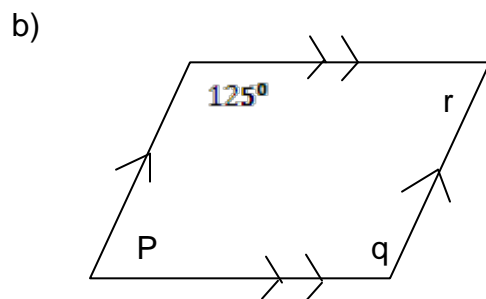
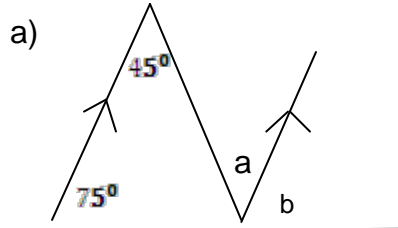


- (b) evaluate the angles marked, p , q , r and s .





1. Determine the size of each marked angle, giving reasons for your answers.



Conclusion

Some important concepts and ideas were introduced in this lesson. These will be linked with other geometrical figures in the lessons that follow.